

REMARKS

Reconsideration of the present application is respectfully requested in view of the following remarks. Claims 16 and 17 are currently pending and under examination in the application.

REJECTIONS UNDER 35 U.S.C. § 103

The Examiner rejects claims 16 and 17 as allegedly obvious over Mitra *et al.* (*Nucleic Acids Research* 27(24)e34: i-iv, 1999) in view of Cole *et al.* (*BioTechniques* 26:748-756, 1999). The Examiner asserts that Mitra *et al.* teach an amplification reaction in acrylamide, and asserts that Cole *et al.* teach gellan for electrophoresis. The Examiner then asserts that it would have been obvious to substitute the acrylamide of Mitra *et al.* for the gellan of Cole *et al.* to arrive at the presently claimed subject matter, and that a person skilled in the art at the time of invention would have had a reasonable expectation of success in making such a substitution.

Applicant traverses this rejection and submits that the instant claims satisfy the requirement for non-obviousness over the cited references. Specifically, Applicant submits that a person skilled in the art would not have been motivated to substitute the acrylamide of Mitra *et al.* with the gellan of Cole *et al.* to arrive at a gellan composition comprising a Mg^{2+} sensitive nucleic acid amplification reaction with a reasonable expectation of success. See M.P.E.P. §§ 2143.01 and 2143.01; and *KSR v. Teleflex, Inc.*, No 04-1350 at 4, 14 (U.S. Apr. 30, 2007) (“A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art”). More specifically, such a person would have lacked the requisite motivation and reasonable expectation of success because the evidence of record teaches that formed gellan gels not only sequester cations such as Mg^{2+} , but sequester such cations almost as strongly as EDTA. Similar to EDTA, gellan would have been considered unsuitable at the time of invention for performing nucleic acid amplification reactions, as presently claimed.

Contrary to the Examiner's assertion (see the Action, page 4), the specification teaches that gellan sequesters Mg^{2+} in the formed gellan gel. Indeed, in interpreting the

specification to suggest that gellan sequesters Mg^{2+} only *during gel formation*, as opposed to sequestering Mg^{2+} *in the formed gel* (see the Action, page 4), Applicant respectfully submits that the Examiner emphasizes one phrase out of context, and fails to consider the cited specification passage as a whole. In fact, the particular phrase relied upon by the Examiner can be found in a lengthier passage stating that “gellan is an unlikely candidate for addition to PCR reactions, as the intact polymer sequesters Mg^{2+} as cross-linking ions for gel formation.” (see, e.g., page 5, lines 25-27 of the specification, emphasis added). Given the statement that gellan is an unlikely candidate for PCR reactions, in combination with the reference to the intact polymer (i.e., the formed gel), the specification clearly teaches not only that gellan sequesters Mg^{2+} during gel formation, but that gellan sequesters Mg^{2+} in the formed gellan gel.

In addition, and also contrary to the Examiner's assertion, Doner *et al.* (*Biotechnology Techniques* 5:25-28, 1991) teach that gellan sequesters Mg^{2+} in the formed gellan gel. In particular, Applicant respectfully disagrees with the Examiner's assertion that Doner *et al.* fail to support the assertion that gellan sequesters Mg^{2+} ions, especially with regard to the Examiner's assertion that this reference “does not speak of magnesium sequestration” (see the Action, page 4). Applicant respectfully submits instead that the Examiner fails to appreciate the fundamental teachings in Doner *et al.*, which show that divalent cations, such as Mg^{2+} , are necessary not only for gellan formation, but also for maintaining the formed gel. Specifically, Doner *et al.* teach that certain chelating agents solubilize formed gellan gels by sequestering divalent cations away from the gellan (see, e.g., Doner *et al.*, page 25, Introduction, last sentence). Given the ability of chelating agents to solubilize a formed gellan gel in this manner, Doner *et al.* clearly demonstrate that gellan sequestration of divalent cations, such as Mg^{2+} , is crucial for maintaining the formed gel. As with the instant specification, Doner *et al.* therefore teach that gellan sequesters Mg^{2+} in the formed gellan gel.

Moreover, and further contrary to the Examiner's assertion, Doner *et al.* teach that gellan sequesters Mg^{2+} to a degree that would have been considered unsuitable for a nucleic acid amplification reaction. Specifically, in showing that EDTA is not very effective at solubilizing gellan (see, e.g., Doner *et al.* at page 26, last paragraph), and in view of the fact that divalent cation sequestration is crucial for maintaining the formed gellan gel (as discussed *supra*), Doner

et al. teach that gellan sequesters Mg^{2+} almost as strongly as EDTA. Since EDTA inhibits nucleic acid amplification reactions by sequestering Mg^{2+} , Doner *et al.* create the expectation at the time of the instant invention that gellan would have similarly inhibited nucleic acid amplification reactions by sequestering Mg^{2+} . When viewed in this light, Doner *et al.* evidence that gellan, in a manner similar to EDTA, would have been considered unsuitable at the time of invention for use with nucleic acid amplification reactions. Doner *et al.* thus teach away from performing nucleic acid amplifications in gellan, as presently claimed.

Applicant submits that a person skilled in the art would not have been motivated to substitute the acrylamide of Mitra *et al.* with the gellan of Cole *et al.* to arrive at a gellan composition comprising a Mg^{2+} sensitive nucleic acid amplification reaction. Moreover, the skilled person would certainly have lacked the requisite reasonable expectation of success in making such a substitution. Given the deficiencies in the prior art, as noted herein, Applicant submits that the Examiner has not established a *prima facie* case of obviousness over the presently claimed subject matter.

Accordingly, Applicant submits that claims 16 and 17 satisfy the requirement for non-obviousness under 35 U.S.C. § 103, and respectfully requests reconsideration and withdrawal of this rejection.

Applicant believes that all of the claims in the application are allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,
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